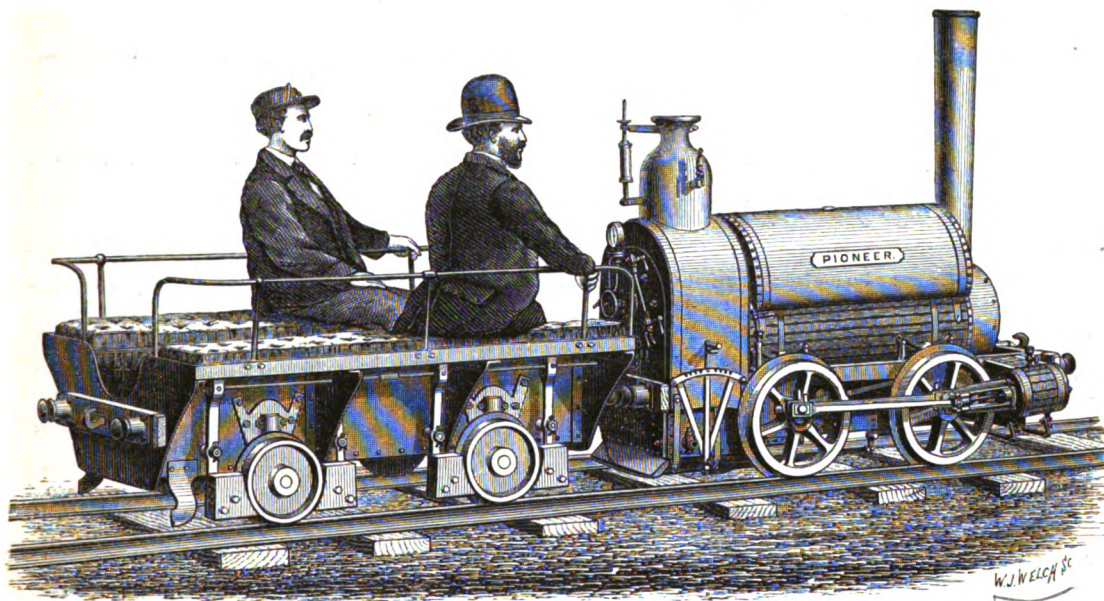


RANSOMES AND RAPIER,

(Successors to the Railway Business of Messrs. Ransomes and Sims),

8, WESTMINSTER CHAMBERS, LONDON,
AND WATERSIDE WORKS, IPSWICH,
ENGINEERS AND FOUNDERS.



Makers of all kinds of Railway Plant, including:

SMALL LOCOMOTIVES.

WAGONS OF TIMBER OR OF WROUGHT IRON.

RAILWAY STATION PUMPING ENGINES.

RAILWAY WORKSHOP ENGINES, BOILERS, AND SHAFTING.

SWITCHES AND CROSSINGS OF ALL KINDS.

RANSOMES AND BIDDELL'S PATENT CHILLED CROSSINGS.

DEAS AND RAPIER'S PATENT UNIVERSAL SWITCH BOXES.

RAPIER'S PATENT INTERLOCKING APPARATUS.

SIGNAL POSTS AND ALL CONNECTIONS.

RANSOMES AND MAY'S CELEBRATED COMPRESSED KEYS AND TRENAILS.

WATER TANKS, WATER CRANES, AND HYDRANTS.

PUMPS FOR RAILWAY STATIONS, DRIVEN BY STEAM, HAND, OR HORSE POWER.

TURNTABLES OF ALL KINDS AND SIZES, FROM 50 FEET TO 3 FEET.

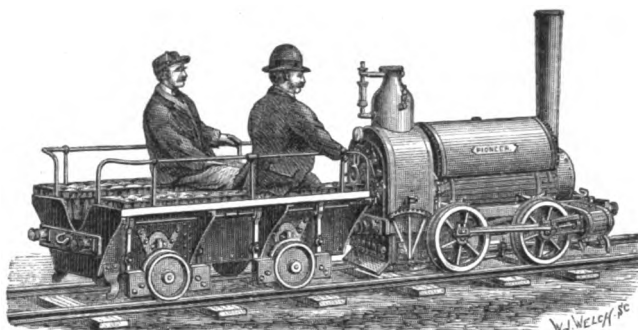
RAILWAY CRANES OF ALL KINDS, STEAM AND HAND.

WHARF AND WAREHOUSE CRANES OF ALL KINDS.

RAILWAY AXLE-BOXES, COLUMNS, GIRDERS, AND GENERAL CASTINGS.

RANSOMES AND RAPIER,

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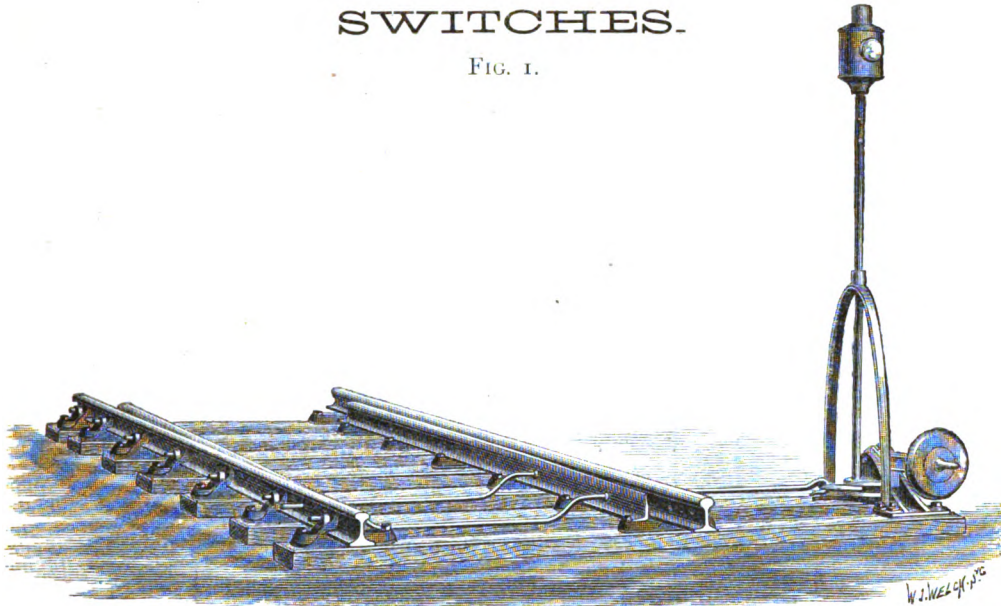
Ransomes and Rapier Manufacture and Supply all kinds of Materials and Fittings for Light Railways, as per the following particulars.

Small Railways made on this principle will (with average cost of Earthworks and Bridges) pay all working expenses, and 7% Dividend as the result of One Full Train each way per day.

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SWITCHES.

FIG. 1.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

Railway Switches of the most approved construction, made of Steel or Iron Rails, of double-headed or Vignoles section; the Tongues are planed accurately to fit the Stock Rails, and all Fittings are furnished complete, including Switch Box, Connecting and Distance Rods, Slide Chairs, Studs and Bolts, &c., at the following

PRICES.

Weight of Ra'l.	Length of Tongues.	Length of Stocks.	If Iron Tongues and Iron Stocks.			If Steel Tongues and Iron Stocks.			If Steel Tongues and Steel Stocks.		
lb.	feet. inches.	feet. inches.	£	s.	d.	£	s.	d.	£	s.	d.
40	*9 0	12 0	9	10	0	10	5	0	11	0	0
"	12 0	15 0	11	10	0	12	5	0	13	0	0
"	15 0	18 0	14	0	0	15	0	0	16	0	0
75	*12 0	15 0	15	10	0	16	10	0	17	10	0
"	15 0	18 0	18	0	0	19	10	0	21	0	0
"	18 0	21 0	20	10	0	22	10	0	24	10	0

Holding-down Bolts for Switches of 40-lb. Rails, 10s. per set.

" " " 75 " " 12s. 6d. "

* The Switches marked thus are those which are usually adopted.

SWITCH BOXES.

Switch Boxes of all kinds. Also Deas and Rapier's Universal Switch Box, made either with Turnover handle or rigid handle; the handles are interchangeable, so that Turnover handles can be substituted for rigid, and *vice versa*.

PRICES.

Weight of Rail.	Price of Box.	Weight of Rail.	Price of Box.	Weight of Rail.	Price of Box.
lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.
80	2 10 0	70	2 5 0	40	1 15 0

SWITCH INDICATORS.

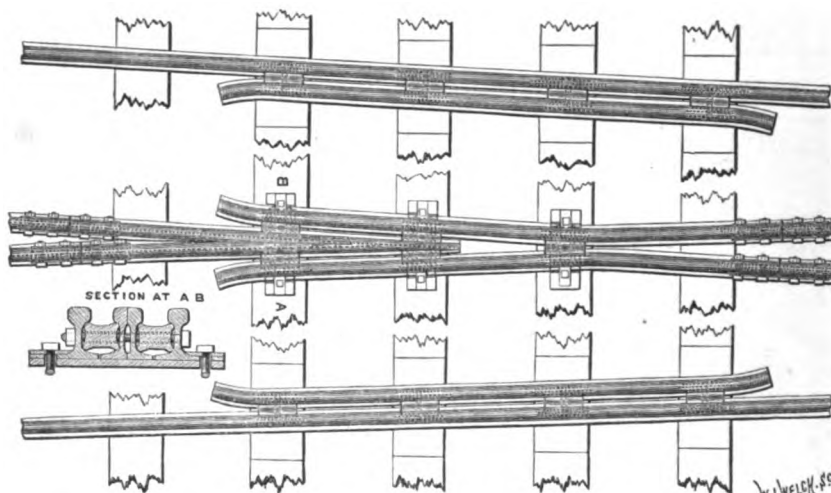
Switch Box, with Deas and Rapier's Patent Indicator, Price £7 5s.; Switch Box, with Russian or Continental Indicator, Price £5 10s., with Lamp complete in both cases.

RANSOMES AND RAPIER,

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CROSSINGS.

FIG. 2.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

CROSSINGS.

The best Crossings for Main-Line use are those made of Bessemer Steel Rails. They can be made reversible or not, as may be preferred.

PRICES (ANY ANGLE).

Weight of Rail.	Price of Crossing in Iron.			Price of Crossing in Steel.			Price of Check Rails and Fittings.			Holding-down Bolts.		
lb.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
40	5	10	0	6	10	0	2	2	0	0	7	6
75	8	0	0	9	10	0	3	10	0	0	10	0

For Sidings and Subordinate Lines, Ransomes and Biddell's CHILLED CROSSINGS are the best and most durable, at the following PRICES.

Angle of Crossing ..	1 in 6	1 in 6½	1 in 7	1 in 7½	1 in 8	1 in 8½	1 in 9	1 in 10	1 in 11	1 in 12
Weight of Rails, 40 lb.	£ 5 0	£ 5 5	£ 5 10	£ 5 15	£ 5 15	£ 6 0	£ 6 5	£ 6 10	£ 6 15	£ 7 0
Weight of Rails, 75 lb.	6 0	6 5	6 10	6 15	7 0	7 5	7 10	8 0	8 10	9 0

Check Rails and Fittings, and Holding-down Bolts for these Crossings, are same prices as for Main-Line Crossings above.

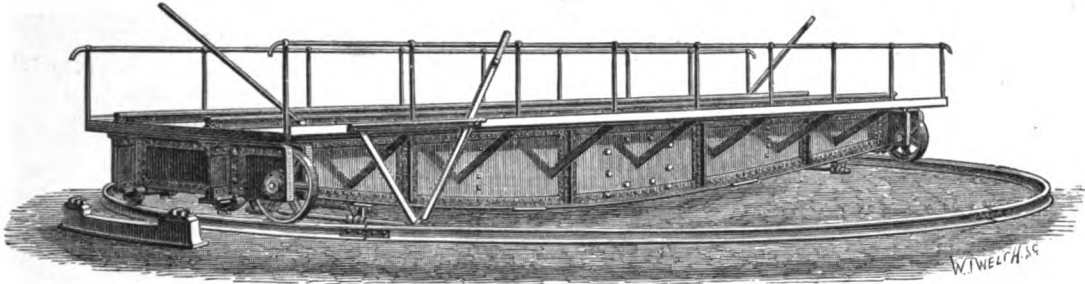
Patterns in Stock for all Angles from 1 in 2 to 1 in 14.

RANSOMES AND RAPIER,

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TURNTABLES.

FIG. 3.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

Turntables, in all sizes up to 50 feet diameter, for turning Engines, with their Tenders, and 18 to 25 feet diameter for turning Tank Engines, and 10 to 18 feet diameter for Carriages, and 3 to 10 feet diameter for miscellaneous purposes.

The main construction of these Tables consists of two wrought-iron girders on which the rails rest, these girders being braced together at either end by wrought-iron stretchers, and also bolted firmly to a centre casting; they are made on the centre-balance principle, i. e. the load is taken on a steel pivot working in a steel cup fitted in the central pedestal, and by this means one man can easily turn an Engine and Tender. They are fitted with locking gear to keep the Table firmly in position while the Engines are running on and off. The tops of the Tables are covered with wood or with chequered iron plates, as may be preferred. The ends of the girders are fitted with horns and wheels, and also with relieving apparatus. The Tables are also supplied with a wrought-iron pit, if required.

PRICES.

30 to 50 feet diam. for engines and tenders, £9 per foot diameter.

18 to 25 feet " " £8 " "

Extras: Chequer-plate top, £2 5s. per foot diam. ; wrought-iron pit, £2 5s. per foot diameter.

10 to 18 feet diam., for turning carriages and wagons. £7 per foot diam., with wood top and iron pit.

" " " " £9 ditto, with chequer-plate top and iron pit.

3 to 9 feet diameter, for workshops, warehouses, &c., £6 per foot diam., with wrought or cast iron top and cast-iron pit.

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2 H 2

FOOT BRIDGE FOR CROSSING A RAILWAY.

FIG. 4.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

FOOT BRIDGES IN CAST OR WROUGHT IRON.

ALSO ALL KINDS OF PLAIN AND ORNAMENTAL CASTINGS, MADE FROM A LARGE STOCK OF
PATTERNS FOR COLUMNS, GIRDERS, SASHES, &c., &c.

PRICE OF THE ABOVE BRIDGE IN CAST IRON, COMPLETE, WITH TIMBER STEPS, HANDRAILS,
AND FLOORING, **£220.**

RANSOMES AND RAPIER,
ENGINEERS, IRONFOUNDERS, AND RAILWAY MATERIALS MANUFACTURERS,
5, WESTMINSTER CHAMBERS, LONDON, AND WATERSIDE IRON-WORKS, IPSWICH.

WATER CRANES.

Fig. 5 represents a Swing-Jib Water Crane. The Jib is made either straight, or of the "swan-neck" shape, and of copper or of cast iron, as preferred; the valve may be actuated by a hand wheel fixed on the Jib, and so worked from the tender. The end of the Jib is fitted with a leather hose-pipe and with a chain for pulling the Crane round. The Crane is fitted with a cock for emptying it after use; also, if desired, a gas jet is fitted on to provide against frost, which is effectually done by the circulation of the water caused by the gas jet.

The advantage of this arrangement is that on the least suspicion of frost the gas can be lighted, and the Crane saved from being frozen, thus avoiding the application of braziers and fires, which frequently crack and destroy the Water Cranes.

PRICES.

6" diameter, £48; 8" diameter, £58; including leather hose-pipe.

Hand wheel fixed on the jib. Price £8 10s. extra.

All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

Fig. 6 shows an Improved Standard Water Crane without a Swing Jib: it is fitted with a stop valve and hand wheel at a height of 2' 6" above the ground, and provided with a leather hose-pipe; also a 6-feet length of service pipe, connected to the valve box by a flange at one end, and to the underground service by a spigot at the other end, a T piece is also provided to complete this connection.

PRICES, including Leather Hose and connections.

Diameter 5", £26. Diameter 6", £32. Diameter 7", £39.

HYDRANTS FOR LOCOMOTIVE SHEDS.

Stand post 3 feet high, with valve and nozzle, and cock for drawing off water in buckets, and also 50 feet of leather hose-pipe, and branch pipe for washing out boilers. Price £16 complete.

Underground Hydrant, in sunk box, with 50 feet of hose and branch pipe. Price £14.

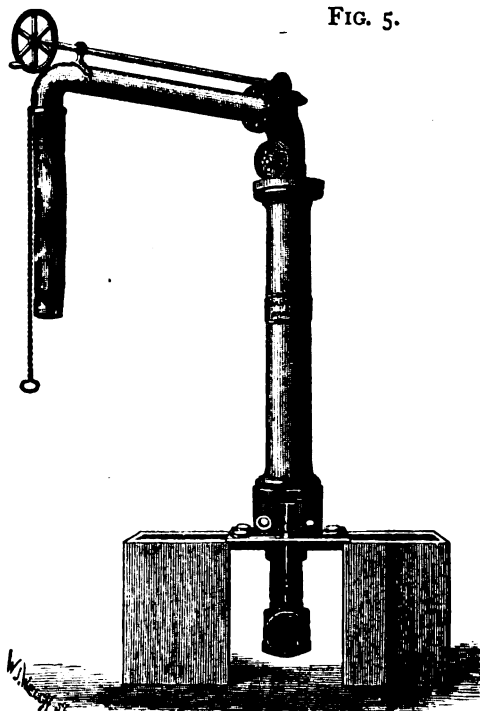


FIG. 5.

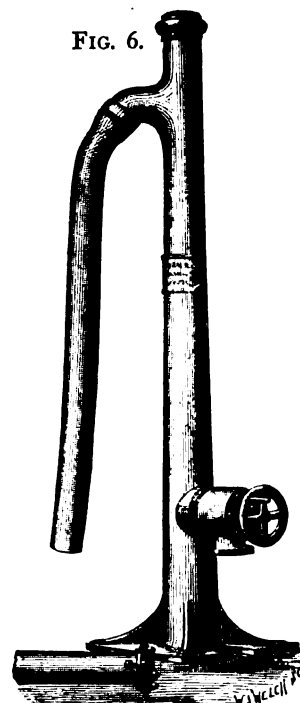


FIG. 6.

RANSOMES AND RAPIER,

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5, WESTMINSTER CHAMBERS, LONDON, AND WATERSIDE IRON-WORKS, IPSWICH.

CAST-IRON WATER TANKS.

FIG. 7.

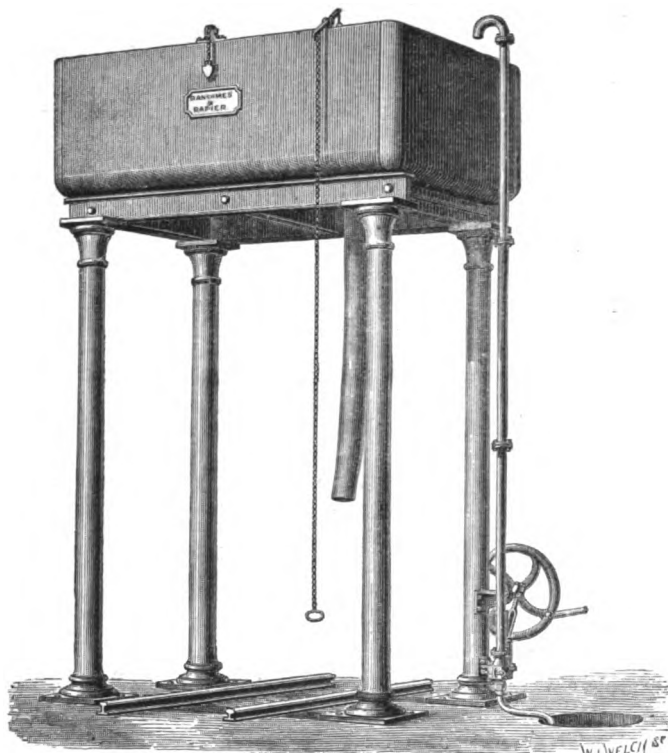


Fig. 7 represents a Cast-Iron Tank, fixed on columns sufficiently high for a locomotive to pass underneath; the edges of the plates are planed die square, so as to ensure a perfect joint, and the plates being all made to template are interchangeable. The Tank is fitted with a hand pump for filling it, and with service valve and hose pipe worked by a lever and chain; it is also fitted with an overflow pipe and with a wood float and indicator. The joints besides being planed are also recessed for stemming with cement.

All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

PRICES OF CAST-IRON TANKS.

11' 6" × 11' 6" × 4' 0" = 3,300 gallons		£111
15' 0" × 15' 0" × 4' 0" = 5,600		160
21' 0" × 21' 0" × 4' 6" = 12,300		230

Including girders for carrying tank on a brick wall, and all fittings inside the house.

If fixed on columns, £11 per column extra.

Hand Pump for filling the tank, with pipes, complete	£25
Ditto, with two barrels	45
Fixed jib, valve, and leather hose-pipe	8 10s.
Swing jib, for fixing to a wall, with leather hose-pipe	26
Deep well pumps, driven by mule or pony, with two solid gun-metal barrels, 3½" × 9", complete, with all fittings and bolts for fixing, air vessel, and pipes to surface	60

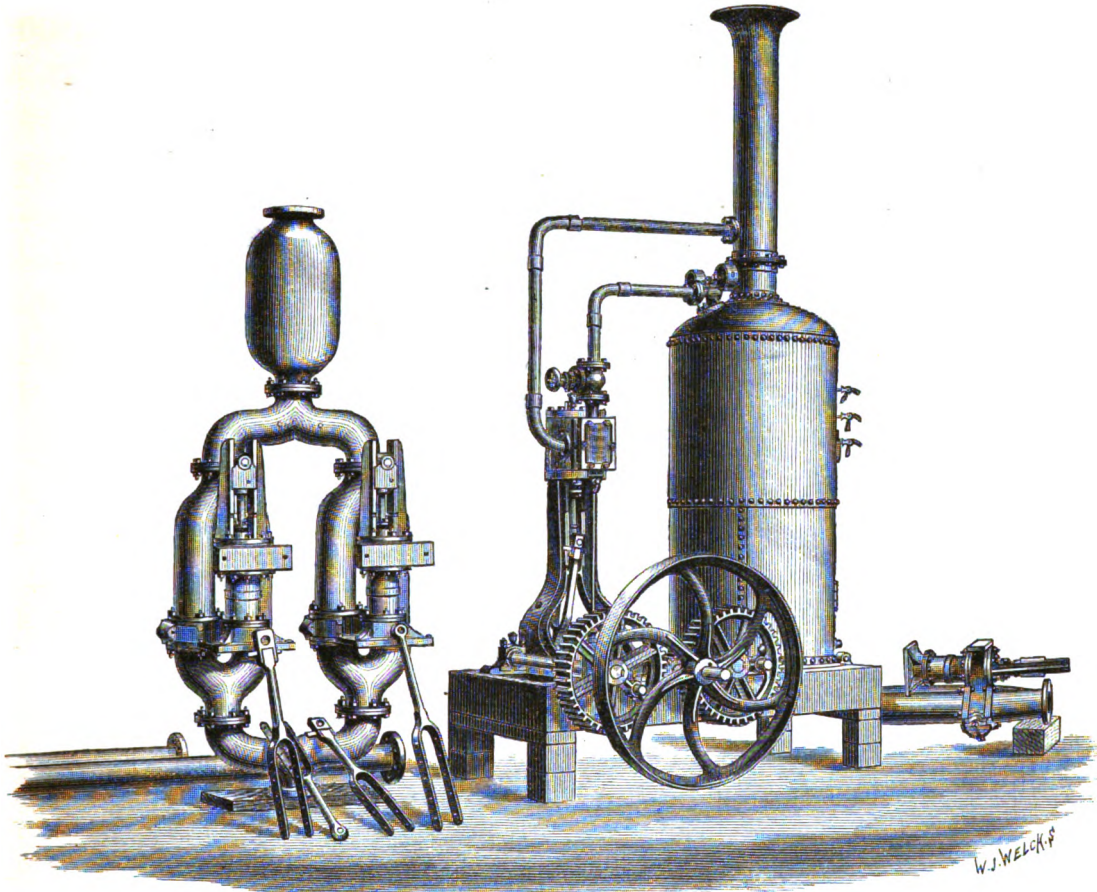
For Wrought-Iron Tanks, see page 240, Fig. 9.

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STEAM PUMPING ENGINE

FOR RAILWAY STATIONS AND OTHER PURPOSES.

FIG. 8.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

The above is a very convenient arrangement, as the Engine and Boiler are fixed on the same bed plate, and thus all pipes and connections can be completely fitted before the Engine leaves the Works.

The Pumps have solid gun-metal barrels, and are double acting; they are fixed in a well or pit, and are driven by timber connecting rods, for which the necessary fittings are supplied.

These Engines are made in a great variety of sizes, from half horse-power to 10 horse-power, and with either one or two pumps.

Price of Engine, with 9" Cylinder, and two double-acting pumps, and a 6 horse-power boiler, complete, with all fittings, £350 = 9000 gallons per hour.

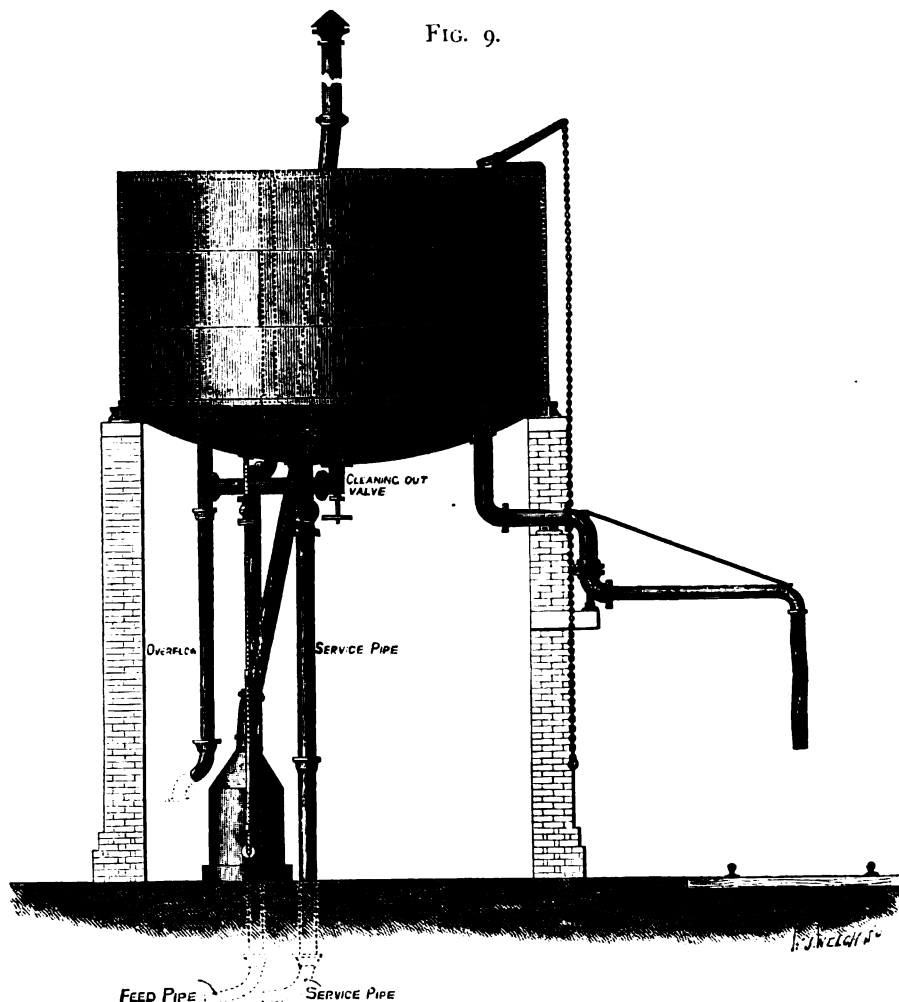
Price of Engine, with 7" Cylinder, and one double-acting pump, with 4 horse-power boiler, and all fittings complete, £240 = 5000 gallons per hour.

Larger and smaller sizes at proportionate prices.

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WROUGHT-IRON WATER TANKS.

FIG. 9.



All Woodcuts are from Photographs of works executed by Ransomes and Rapier.

The above Illustration represents a Circular Station-Tank, made of wrought iron (mounted on a circular cast-iron girder-shaped kerb, or seating, made in segments and bolted together). The Tank plates are all made to template, and are interchangeable.

A copper Swing Jib with leather hose is mounted on a pivot and carried by a stone corbel built in the wall.

For cold climates a heating Boiler with circulating pipes is provided, to be fixed on a stone or cast-iron base in the Tank House, with a wrought-iron chimney passing through the Tank.

These Tanks are also fitted with overflow pipe, cleaning-out valve and pipe, feed pipe, and service pipe.

PRICES OF TANKS.

No. of Gallons.	Diameter.	Depth.	Price of Tank, including overflow pipe, cleaning-out valve and pipe, feed pipe, and service pipe.		
7,700	14' 0"	8' 0"	£	s.	d.
11,250	16' 0"	9' 0"	110	0	0
15,940	18' 0"	10' 0"	130	0	0
			150	0	0

Heating Stove and Chimney, and Circulating Pipes, price £40.

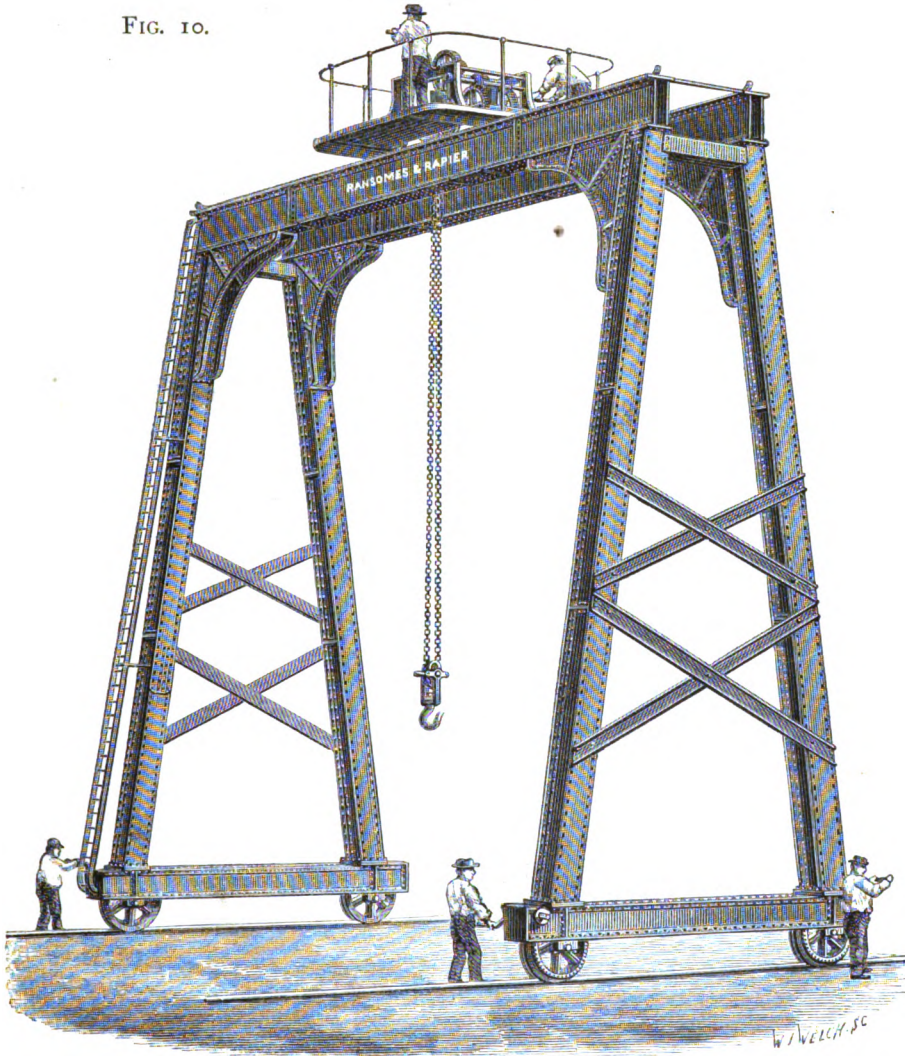
Copper Swing Jib and Connections to Tank, with valve, lever, and chain, price £26.

For Cast-Iron Tanks, see page 238, Fig. 7.

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WELLINGTON CRANES.

FIG. 10.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

These Cranes are made of Wrought Iron, on the box-girder principle, as shown in the Illustration. They are thus very easily taken to pieces, and are convenient for shipment and re-erection. All the parts are put together with turned bolts.

The Crab is of very strong construction, and is complete with chain of ample strength, and each chain has a test certificate.

PRICES.

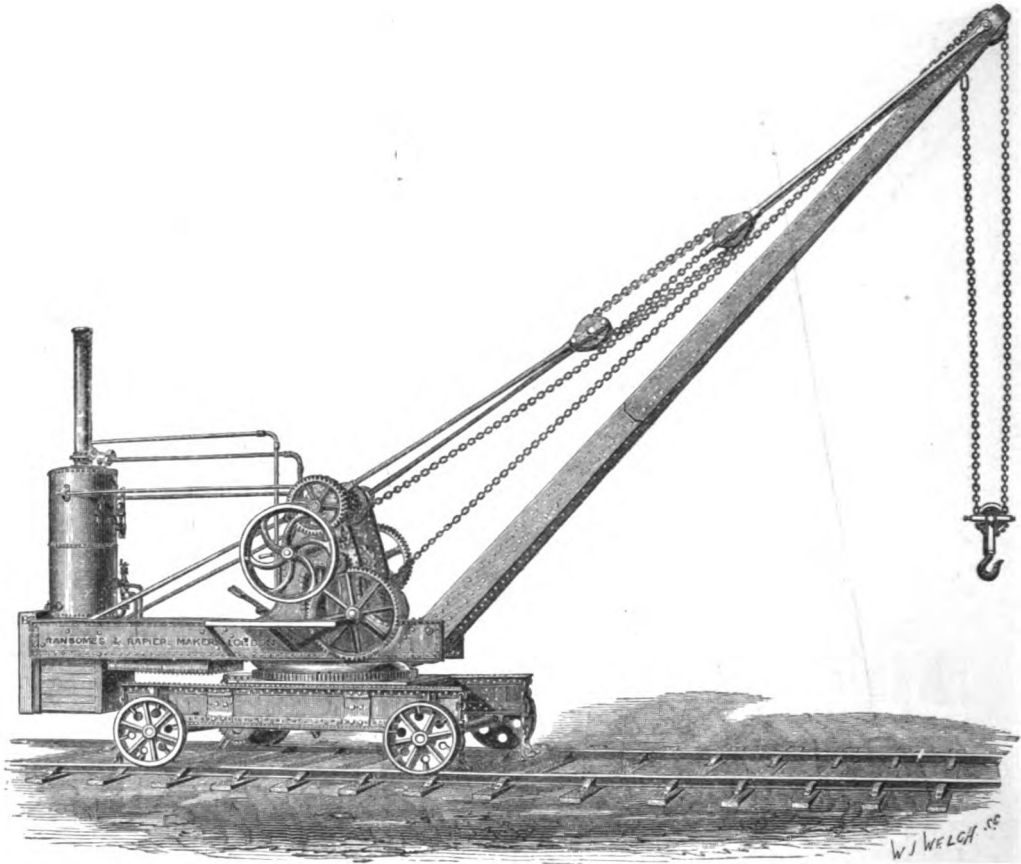
To lift	Span.	Height.	Price.
tons.	feet.	feet.	£
10	20	20	380
15	30	30	550
20	40	40	700

Cranes of any form, size, or strength, at proportionate prices.

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STEAM CRANES.

FIG. 11.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

The Woodcut is an illustration of some Steam Cranes recently built. The Framing and Jib are entirely of wrought iron, and the leading dimensions are as follows: Maximum load, 15 tons; radius of Jib, 40 feet; gauge of line, 16 feet; weight of the machine, 40 tons. PRICE £1050.

If to travel by steam power, £165 extra.

Another size, to lift 8 tons at a radius of 25 feet:—Gauge of line, 9 feet; weight of machine, 20 tons. PRICE £620.

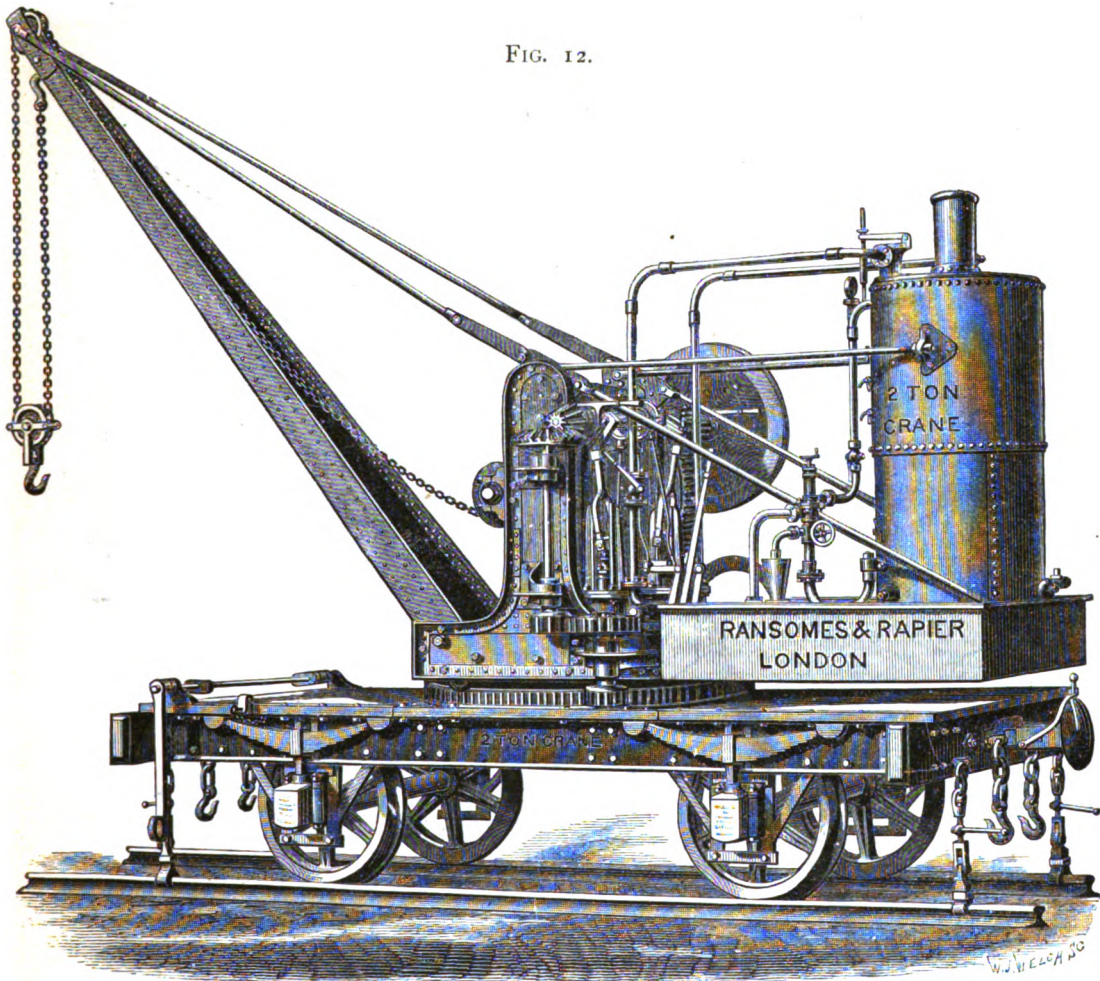
If to travel by steam power, £125 extra.

These Cranes are made with adjustable Jibs, so that the load may be taken up close to the Crane and set down at the extreme reach of the Jib, or *vice versa*. The workmanship throughout is of the best Engine-work class.

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RAILWAY CRANES.

FIG. 12.



WITH OR WITHOUT STEAM POWER.

All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

The Carriage is adapted for travelling in company with other vehicles on the railway, and the Jib can be lowered for the same purpose.

Sizes. To lift	Price, with Steam Power.	Price, worked by Hand only.	Radius of Jib.
tons.	£	£	
2	420	270	14 ft.
3	470	300	15 „
5	550	350	16 „
10	820	570	17 „

The Cranes are furnished with Rolled Joist Iron Girders for propping them up when the Cranes are at work on heavy loads. The above prices are for gauges not exceeding 5 feet 6 inches.

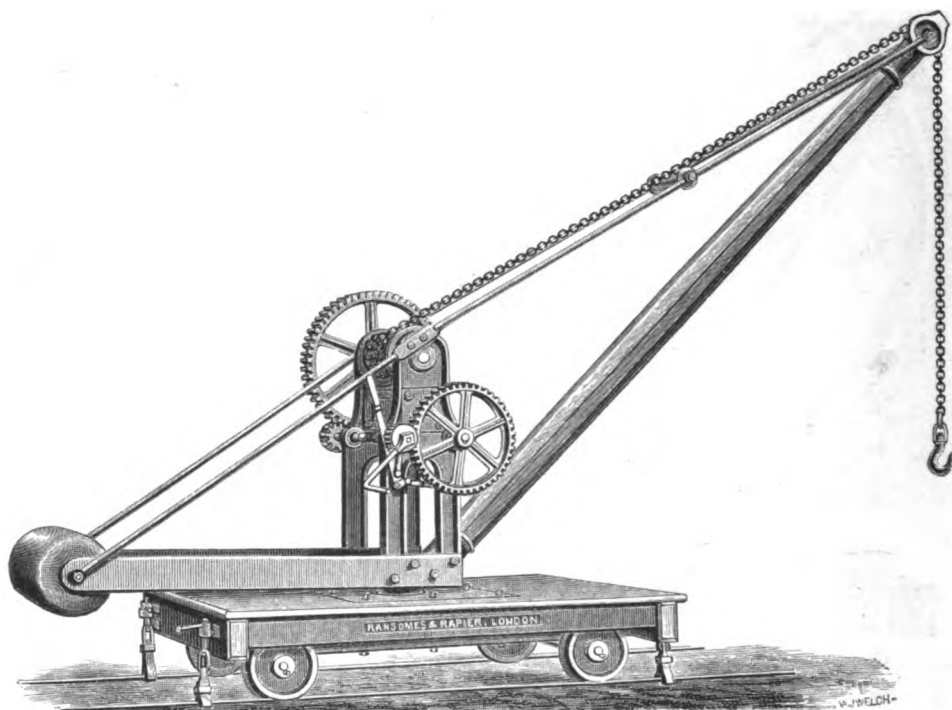
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2 1 2

WHARF AND WAREHOUSE CRANES.

PORTABLE OR FIXED.

FIG. 13.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

The Woodcut shows a *Portable Crane* of the kind commonly used on Wharves and in Warehouses. Ransomes and Rapier also make *Fixed Wharf Cranes*, and small *Fixed Warehouse Cranes*, and also *Whip Cranes*.

In all these Cranes wrought iron is used as much as possible, and all the work is got up in the best style. All Chains are tested, and Certificates are sent with them if desired.

PRICES.

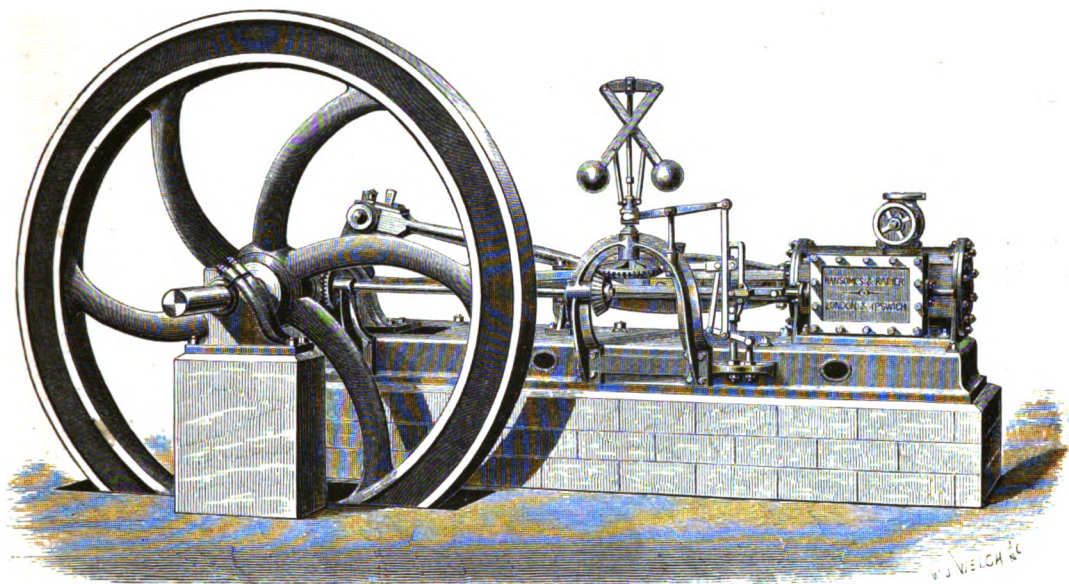
To lift	Portable Crane.	Fixed Wharf Crane.	Fixed Warehouse Crane.	Whip Crane.
tons.	£	£	£	£
1½	100	..	40	45
2	110	..	45	50
3	130	..	60	..
5	250	220	..	..
10	360	300	..	..

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STATIONARY ENGINES AND BOILERS.

FIG. 14.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

Stationary Engines specially adapted for driving the machinery of railway workshops, saw mills, and for other purposes. The Woodcut illustrates a Horizontal Engine, but the same Engine is also adapted for placing vertically against a wall. They can be fitted either with or without expansion gear. The expansion gear may be actuated by the governor or by hand, as may be preferred.

PRICES.

Horse-power.	Size of Cylinder.	Price with Single Crank.	Double-cranked Axle, extra.	Expansion Gear, extra.	Cornish, Lancashire, Tubular, or Vertical Boiler.
6	8" x 10"	£ 110	£ 8	£ 15	£ 100
8	9" " 12"	135	10	20	125
10	10" " 14"	160	12	25	150
12	12" " 16"	185	15	30	170
15	14" " 18"	225	18	35	200
20	16" " 21"	290	20	40	250
25	16" " 30"	345	25	45	300
30	18" " 32"	400	30	50	350

The Cornish, Lancashire, and Vertical Boilers all have Galloway tubes in them, which are of great value in increasing the circulation in the Boiler, as well as in adding to the heating surface.

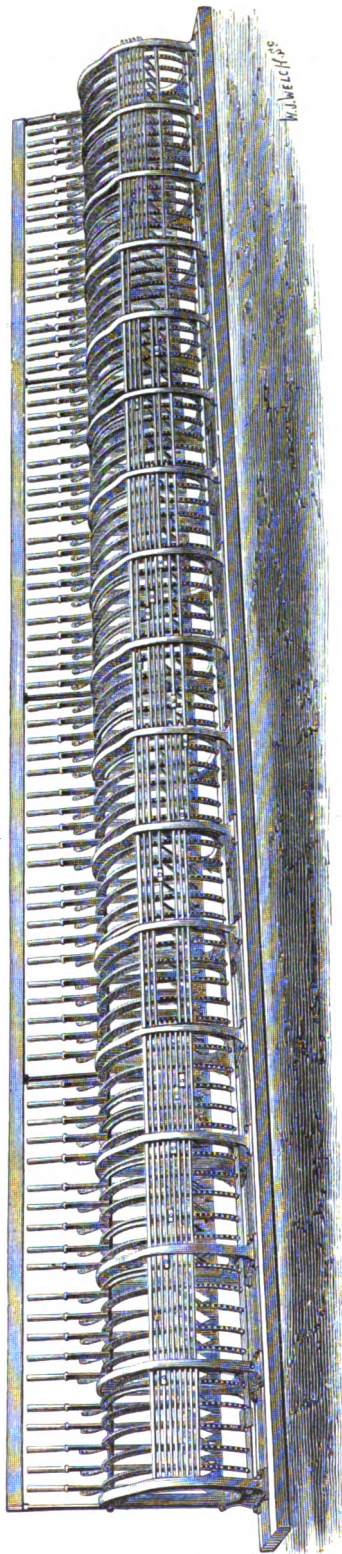
Any of the above Engines can be arranged two together very conveniently, and so that either one can be thrown out of work as circumstances may require.

RANSOMES AND RAPIER,

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5, WESTMINSTER CHAMBERS, LONDON, AND WATERSIDE IRON-WORKS, IPSWICH.

RAPIER'S PATENT INTERLOCKING MACHINE, FOR WORKING THE SIGNALS AND SWITCHES OF RAILWAYS.

FIG. 15.



All Woodcuts are from Photographs of work executed by Ransomes and Rapier.

The Engraving represents a frame containing eighty levers, fixed at the level crossing of the G. N. R. and M. S. L. railways at Lincoln.

This machine consists of a smaller number of moving pieces, and is much simpler than any previously constructed.

Its general principle is as follows: Each lever has a quadrant or sector forged on it, and the levers are all mounted in a frame, so that the sectors pass through a tier of locking bars. Each switch lever has one of these locking bars belonging to, and actuated by, it. Notches are cut in the sectors and in the locking bars in those positions in which the one should be allowed to pass through the other, and wherever "locking" is desired the bar or sector is left solid, and so erroneous movements are prevented.

This system is so complete that an ordinary junction-frame is completely interlocked with only six moving pieces, and the above frame of eighty levers is interlocked with less than thirty moving pieces.

The advantages naturally arising from this very great simplicity are as follows:

1. Certainty and promptness in the locking.
2. Great durability (the machines are guaranteed to require no repairs for ten years).
3. Great strength, all the moving parts being made of wrought iron, and machine cut.
4. All the locking gear is in sight, and is so near to the hand of the operator that he cannot strain or disable it.
5. The apparatus is all above the floor, thus avoiding the large holes usually required in the floor, and this greatly adds to the comfort of the signal houses.

Price £8 per Lever.

RANSOMES AND RAPIER,

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SEMAPHORE SIGNAL-POSTS

(WROUGHT IRON).

FIG. 16.

SIGNALS of all kinds. The Posts of Wood or Wrought Iron, as may be preferred.

All kinds of FITTINGS for connecting, with Locking Apparatus, supplied on the most reasonable terms.

PRICES OF STATION SIGNAL-POSTS,

WITH TWO ARMS, LAMP WITH TWO LENSES, ETC., COMPLETE.

	15 Feet.			20 Feet.			25 Feet.			30 Feet.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Wood Posts	20	0	0	22	0	0	25	0	0	28	0	0
Wrought-Iron Posts	22	0	0	24	0	0	28	0	0	32	0	0

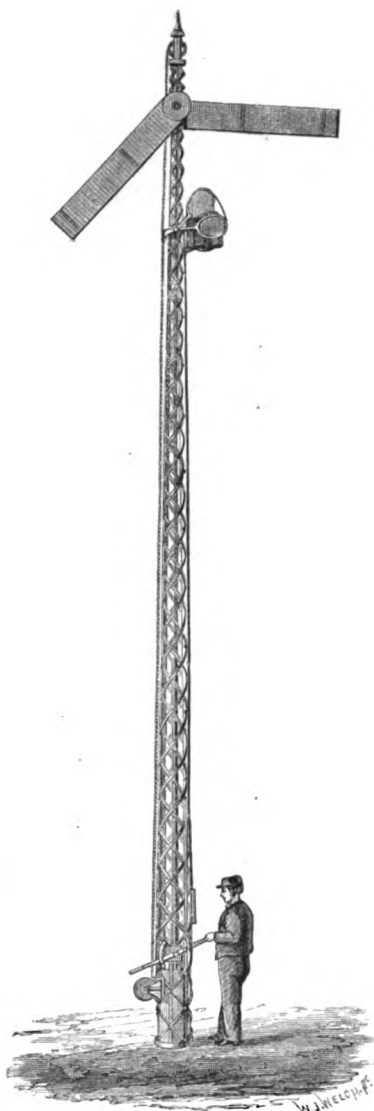
	35 Feet.			40 Feet.			50 Feet.			60 Feet.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Wood Posts	32	0	0	37	0	0	42	0	0	48	0	0
Wrought-Iron Posts	36	0	0	42	0	0	47	0	0	54	0	0

Extra Arms and Lamps on the same Post, price £6 10s.

Distant Signal Posts, with one Arm and Lamp, all Gear, and 600 yards Galvanized Wire, with a proportion of Straight Pulleys and Angle Pulleys, and one large Ground Pulley, complete, price £40 with Iron Post, and £38 with Wood Post.

Iron Stakes to carry the Pulleys, price £6 extra per signal.

Wood Stakes ditto price £2 10s. „ „

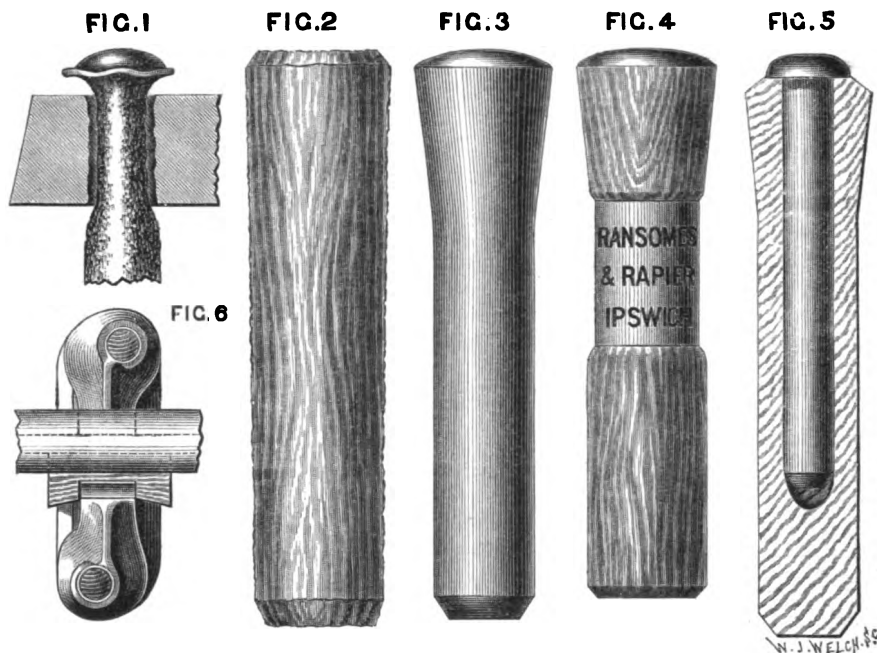


All Woodcuts are from Photographs of work executed by Ransomes & Rapier.

RANSOMES AND RAPIER,

ENGINEERS, IRONFOUNDERS, AND RAILWAY MATERIALS MANUFACTURERS,
5, WESTMINSTER CHAMBERS, LONDON, AND WATERSIDE IRON-WORKS, IPSWICH.

KEYS AND TRENAILS.



Woodcut Fig. 1 shows the effect of rain and motion on Spike Fastenings, and their consequent untrustworthiness.

Figs. 2, 3, 4 show the superior Wood Trenails which have been almost universally used on the principal English Railways for 34 years (since 1841).

Fig. 2 shows the piece of fine straight-grained Oak (selected by special machinery) before compression.

Fig. 3 shows the size and appearance of the Trenail after compression.

Fig. 4 shows a Trenail which has had a clip put round part of it, and has then been steamed to allow the other parts to re-expand to the former dimensions, and shows how tightly the Trenail grips the sleeper after being driven. Besides increasing the strength, compression multiplies the durability of the Trenail fourfold.

PRICE OF BEST COMPRESSED OAK TRENAILS, £4 PER THOUSAND.

Fig. 5 shows the improved form of Compound Trenails, which combines all the advantages of the holding power of the Trenail, with the additional transverse strength given by the insertion of an iron spike. This is the most perfect form of fastening.

PRICE OF THE BORED TRENAILS, £4 5s. PER THOUSAND.

Fig. 6 shows the Patent Compressed Wood Keys, which after being driven swell again slightly, and so do not become loose.

PRICE OF COMPRESSED KEYS: FIR, £4 10s.; ELM, £5 10s.; OAK, £6 10s. PER THOUSAND.

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